

# PV-ESS-Diesel On/Off-Grid All-in-One System

\* Triple-layer protection \* Intelligent dispatching \* Black start \* Off-grid independent Operation (STS)



## • Overview

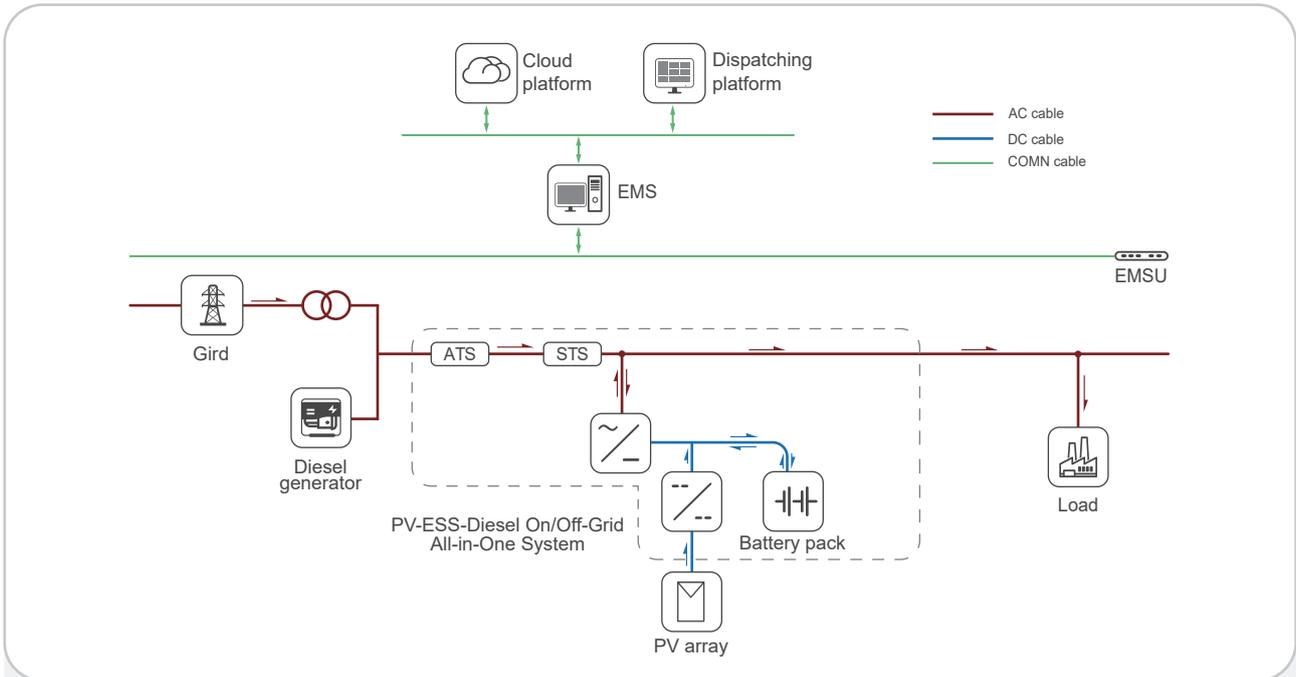
The PV-ESS-Diesel All-in-One System is a highly integrated smart energy solution that deeply combines PV power, energy storage, diesel generator backup, and smart grid interaction capabilities. Through the integration of hardware (including energy storage batteries, PCS, MPPT, and STS) and intelligent energy management software, the system enables dual operational modes: "on-grid for energy savings and off-grid for backup power."

It establishes a 3-tier power supply structure prioritizing solar energy, buffered by storage, and backed up by diesel generation. In the event of grid anomalies, the system achieves seamless transition to off-grid microgrid operation within 10 milliseconds, ensuring zero-interruption power supply for critical loads, making it especially suitable for scenarios with extremely high requirements for power continuity.

When connected to the grid, the system prioritizes solar power, uses stored energy to shave peak loads, and keeps the diesel generator as a last-resort backup, enhancing efficiency and cutting costs. When operating independently off-grid, it intelligently coordinates solar generation, battery storage, and the diesel generator to optimally distribute energy, significantly saving fuel and reducing operational expenses.

The system supports 3 modes: on-grid, off-grid, and seamless switching, enabling participation in grid interactions or operation as an independent microgrid. This significantly enhances energy autonomy and disaster resilience. Its integrated design greatly simplifies installation and commissioning, reduces coordination costs and operational complexity, making it suitable for various scenarios such as remote areas, base stations, factories, and islands.

## • System Topology



## Applicable Equipment:



BESS  
50-126-75



BESS  
60-217-75



BESS  
125-271-240

## • Applications



Back Up



Emergency power supply



Self-Generation and  
Self-Consumption



Micro-grid

# BESS

## PV-ESS-Diesel On/Off-Grid All-in-One System

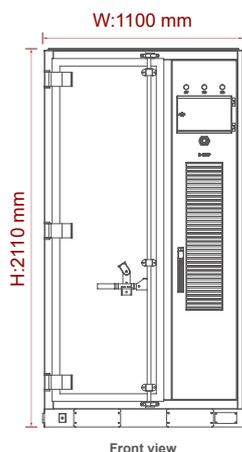
### BESS 50-126-75



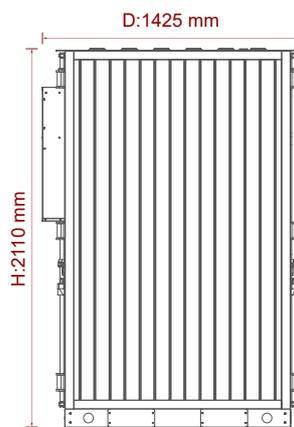
#### • Features

- Status Indication: Shows system status, including load, storage capacity, and power.
- Multi-Mode Operation: Supports multi-level priority control for reliable power from grid, PV, and loads.
- Battery Management: Integrated BMS for battery monitoring and protection.
- Remote Monitoring: Multi-end remote access via self-service platform and device-side protocols.
- Easy Installation: IP54 cabinet with flexible installation options.

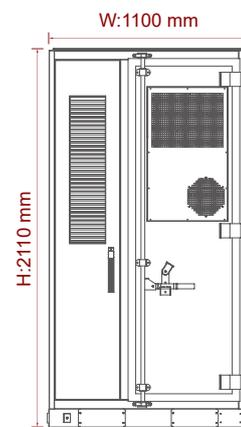
#### • Product Dimensions



Front view



Side view



Back view


**• Technical Parameter**

<b>BESS 50-126-75</b>		
<b>Battery Parameters</b>		
<b>Battery Module</b>	Voltage	57.6V
	Capacity	314Ah
	Energy	18 kWh
	Cooling method	Dry Self-Cooling
<b>Battery Cluster</b>	Rated voltage	403V
	Grouping method	1P126S
	Rated capacity	314Ah
	Output voltage range	352.8V~447.3V
	Rated energy	126.6kWh
	Maximum continuous charging current	157A
	Maximum continuous discharge current	157A
<b>Work Environment</b>	Charging temperature	0~45°C
	Discharge temperature	-20~50°C
	Operating humidity	RH≤80%
<b>Storage Environment</b>	Short term storage(<1months)	-20~55°C
	Storage humidity	RH≤80%
<b>PCS Parameters</b>		
<b>PCS</b>	Rated current	73A
	overload capacity	x 1.25 (100S)
	output power	50kW
	AC port voltage	3P3W+PE/3P4W+PE, 400 V
	frequency	50Hz
	Power factor	-1~1
	Battery side voltage	350V-850V
<b>Parallel</b>	Parallel	Max 5 PCS
<b>STS</b>	Switching time	<10 ms
<b>PV</b>	Maximum power	38.4kW+38.4kW
	Number of branch inputs	2
	PV Max voltage	850V
	PV start voltage	250V
	MPPT voltage range	200V-800V
	Maximum PV current	64A+64A
<b>System Parameters</b>		
<b>System Parameters</b>	Dimension(W*D*H)	1100*1425*2110mm
	Weight(kg)	1620KGS
	Degree of protection	IP54
	Working temperature range	-30~60°C > 45 (derating)
	Cooling	Dry Self-Cooling
	Relative humidity	5~95%(no condensation)
	Highest altitude	4000m(>2000m derating)

# BESS

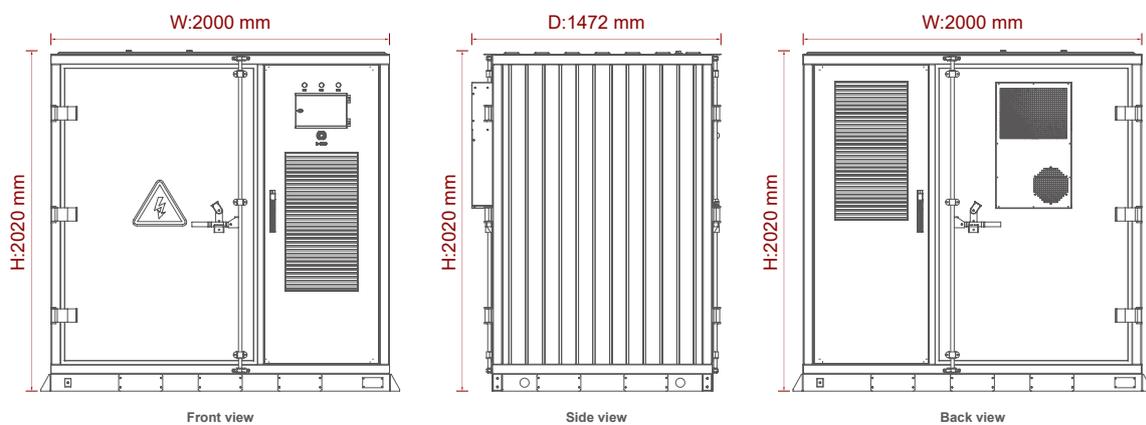
## PV-ESS-Diesel On/Off-Grid All-in-One System BESS 60-217-75



### • Features

- All-in-one design with a high degree of integration.
- Modular design with optional modules of different sizes.
- Support for grid-connected and off-grid operation.
- MPPT Solar controller available as an option.
- IP54 class fire and explosion-proof housing.
- Patented air duct design, Dry Self-Cooling, 3-5°C temperature difference of the battery cell.

### • Product Dimensions




**• Technical Parameter**

<b>BESS 60-217-75</b>		
<b>Battery Parameters</b>		
<b>Battery Module</b>	Voltage	57.6V
	Capacity	314 Ah
	Energy	18 kWh
	Cooling method	Dry Self-Cooling
<b>Battery Cluster</b>	Rated voltage	691.2V
	Grouping method	1P 216 S
	Rated capacity	314 Ah
	Output voltage range	604.8V~766.8V
	Rated energy	217.03kWh
	Max continuous charging current	157 A
	Max continuous discharge current	157 A
<b>Work Environment</b>	Charging operation temperature range	0~45°C
	Discharging operation temperature range	-20~50°C
	Working humidity	RH≤80%
<b>Storage Environment</b>	Short-term storage temperature(<1month)	-20~55°C
	Storage humidity	RH≤80%
<b>Cabinet</b>	Protection level	IP54
<b>PCS Parameters</b>		
<b>PCS</b>	Rated current	87A
	PCS overload capacity	x 1.25(100S)
	PCS output power	60kW
	AC-side voltage of PCS	3P/N/PE, 230 V / 400 V
	Frequency	50Hz/47Hz~52Hz(60Hz/57Hz~62Hz)
	Power factor	-1~1
	Battery side voltage	420V-850 V
<b>Parallel</b>	Parallel	Max 5 PCS
<b>STS</b>	Switching time	<10 ms
<b>PV</b>	Max power	38.4kW+38.4kW
	Number of branch inputs	2
	PV Max voltage	850V
	PV startup voltage	250V
	MPPT voltage range	200V-800V
	PV Max current	64A+64A
<b>System Parameters</b>		
<b>System Parameters</b>	Dimension(W*D*H)	2000*1472*2020mm
	Weight(kg)	< 2900
	Display	7-inch Resistive Touch Screen
	Fire protection systems	Aerosol Fire Module
	Degree of protection	IP54
	Certification	CE;IEC62619;UN38.3
	Working temperaturerange	-30~60°C(> 45°C derating)
	Cooling	Dry Self-Cooling
	Relative humidity	5~95%(No Condensing)
	Highest altitude	4000m(>2000m derating)

# BESS

## PV-ESS-Diesel On/Off-Grid All-in-One System

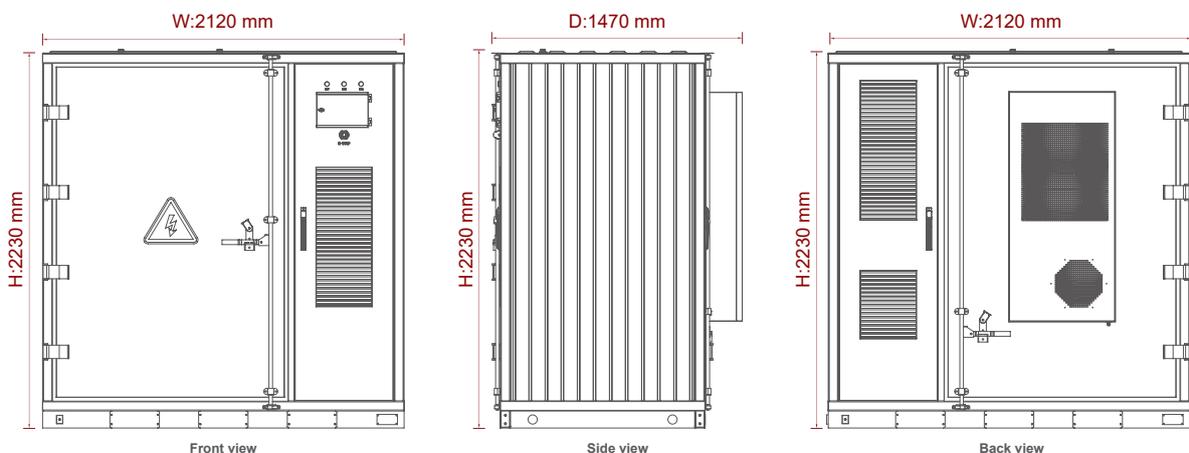
### BESS 125-271-240 (120)



#### • Features

- Status Indication: Shows system status, including load, storage capacity, and power.
- Multi-Mode Operation: Supports multi-level priority control for reliable power from grid, PV, and loads.
- Battery Management: Integrated BMS for battery monitoring and protection.
- Remote Monitoring: Multi-end remote access via self-service platform and device-side protocols.
- Easy Installation: IP54 cabinet with flexible installation options.

#### • Product Dimensions




**• Technical Parameter**

<b>BESS 125-271-240 (120)</b>		
<b>Battery Parameters</b>		
<b>Battery Module</b>	Voltage	57.6V
	Capacity	314 Ah
	Energy	18 kWh
	Cooling method	Dry Self-Cooling
<b>Battery Cluster</b>	Rated voltage	864V
	Grouping method	1P 270 S
	Rated capacity	314 Ah
	Output voltage range	756V~950V
	Rated energy	271kWh
	Max continuous charging current	157 A
	Max continuous discharge current	157 A
<b>Work Environment</b>	Charging operation temperature range	0~45°C
	Working humidity	RH≤80%
	Storage humidity	RH≤80%
<b>PCS Parameters</b>		
<b>PCS Parameter</b>	Rated current	181A
	PCS overload capacity	x1.1 continuous;x1.25(30ms)
	PCS output power	125kW
	AC-side voltage of PCS	3P/N/PE, 230 V / 400 V
	Frequency	50Hz/60Hz
	Power factor	-1~1
	Battery side voltage	680V-950 V
<b>Parallel</b>	Parallel	Max 5 PCS
<b>STS</b>	Rated power	170KVA
	AC voltage	400V/230V(-20%~15%)
	Frequency	50Hz/60Hz(±5Hz)
	Max AC current	250A
	Switching time	<10 ms
<b>MPPT</b>	PV side	
	Max power	120kW*2 (120kW)
	MPPT voltage range	200V-950V
	Rated voltage	600V
	Startup voltage	250V
	PV input string	4
	PV Max current	50A+50A+50A+50A
	Short-Circuit Current	60A+60A+60A+60A
	High voltage side	
	Voltage range	500V-950V
Rated voltage	680V	
Max current	180A	
<b>Parallel</b>	Parallel No.	Max 5 pcs
<b>System Parameters</b>		
<b>System Parameters</b>	Dimension(W*D*H)	2120*1470*2230mm
	Weight(kg)	3210kgs
	Display	7-inch Resistive Touch Screen
	Fire protection systems	Aerosol Fire Module
	Degree of protection	IP54
	Certification	CE;IEC62619;UN38.3
	Working temperature range	-30~60°C(> 45°C derating)
	Cooling	Dry Self-Cooling
	Relative humidity	5~95%(No Condensing)
	Highest altitude	4000m(>2000m derating)

# PV-ESS-Diesel On/Off-Grid System

\* PV + ESS + DG hybrid system \* Off-grid independent Operation (STS) \* Black start



## • Overview

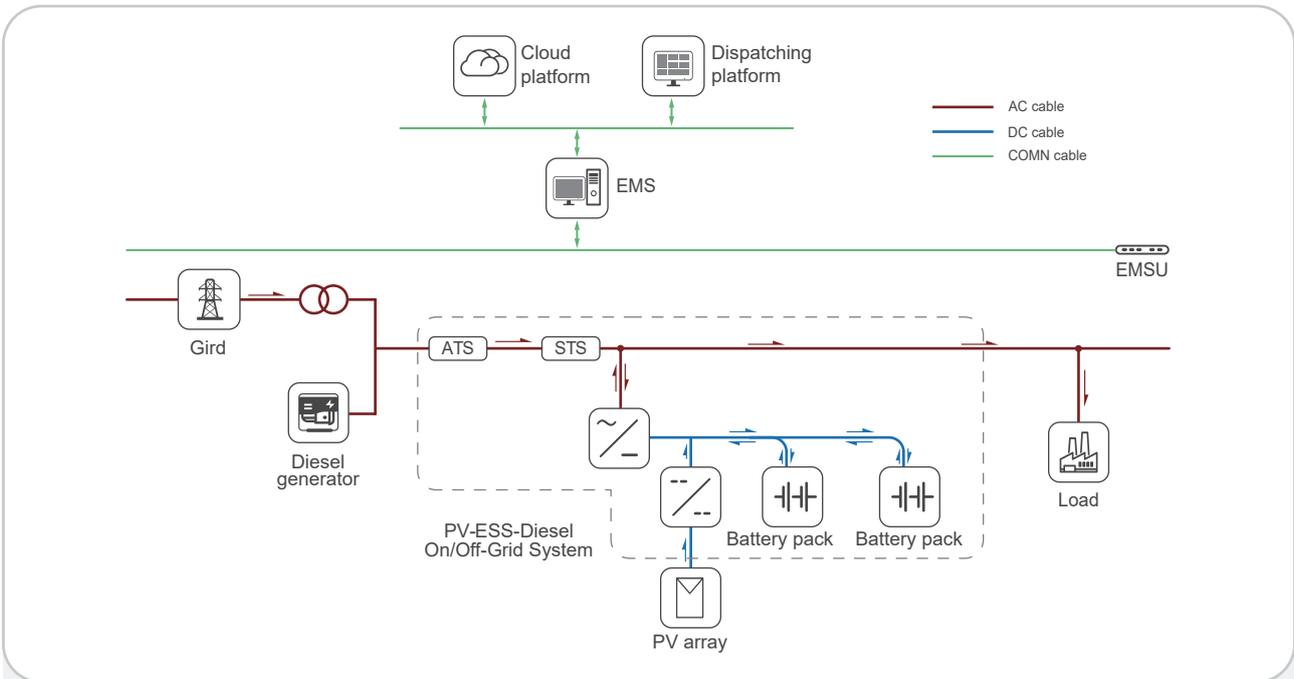
The Large-Scale PV-ESS-Diesel On/Off-Grid System is specifically designed for industrial facilities, parks, and major off-grid applications. By integrating high-capacity Power Conversion Systems (PCS), battery energy storage systems, and automated diesel generator sets, it establishes a comprehensive energy base equipped with grid-level regulation capabilities and highly reliable island operation.

The system features millisecond-level on/off-grid switching, capable of independently forming a large-scale, stable microgrid to ensure zero interruption to critical production loads. Through intelligent dispatch, it achieves coordinated optimization of solar, storage, and diesel generation. When connected to the grid, it participates in demand management and peak-valley arbitrage; when off-grid, it minimizes diesel generator runtime, significantly reducing the total lifecycle energy cost. It can function both as a Virtual Power Plant (VPP) unit to support grid frequency and peak regulation, and achieve long-term energy self-sufficiency during grid outages or in remote areas, thereby enhancing users' strategic energy supply security.

This system represents an advanced form of medium-to-large-scale distributed energy systems, offering high-energy-consumption users under the "Dual Carbon" goals a reliable pathway that combines decarbonization, supply security, and cost reduction.



## • System Topology



## Applicable Equipment:



UPV-S  
Three Phase Solar+Storage Hybrid Inverters



Energon Series Outdoor  
Energy Storage Battery Cabinet

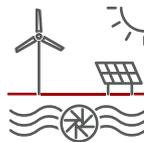
## • Applications



Back Up



Emergency power supply



Self-Generation and  
Self-Consumption



Micro-grid

# UPV-S

## Three Phase Solar+Storage Hybrid Inverters



### • Features

- **Operating Status Indication:** Integrated energy storage system working status, transformer-area load, energy storage capacity, power metrics.
- **Multi-Modal Operation:** Enables multi-priority management for grid, PV and load power supply, ensuring reliability across all modes.
- **Battery Pack Management:** Incorporates a BMS for comprehensive monitoring of cell and protection.
- **Remote Monitoring & Control:** Supports self-service platform monitoring and protocol integration for multi-terminal remote access.
- **Easy Installation:** IP54-rated cabinet for dust/water resistance; flexible deployment in diverse environments.


**• Technical Parameter**

<b>UPV-S 1200kW Three Phase Solar+Storage Hybrid Inverters</b>	
<b>PCS Parameters</b>	
Module	
Rated current	145A*12
Overload capacity	x1.1Normal/1.25 (30ms)
Output power	100kW*12
AC-side voltage of PCS	3P/N/PE, 230 V / 400 V
Frequency	50Hz/60Hz
Power factor	-1~1
Battery side voltage	680-900 V/Max 950V
Max battery current	200A*12
<b>STS Parameters</b>	
System	
Rated power	600kVA*3
AC voltage	400V/230V (-20%~15%)
Frequency range	50Hz/60Hz (±5Hz)
Max AC current	870A*3
Switching time	<10ms
<b>PV Parameters</b>	
PV Side (Module)	
Rated power	120kW*6
MPPT voltage range	200V-850V
Rated voltage	600V
PV startup voltage	250V
Number of branch inputs	4*6
PV Max current	240A*6
High Voltage Side (Module)	
Voltage range	500V-950V
Rated voltage	680V
Max current	180A*6
<b>System Parameters</b>	
Dimension(W*D*H)	3000*1267*2400mm
Weight(kg)	2660
Degree of Protection	IP54
Working Temperature Range	-30~60°C(> 45°C derating)
Cooling	Dry Self-Cooling
Relative Humidity	5~95%(no condensation)
Highest Altitude	4000m(>2000m derating)

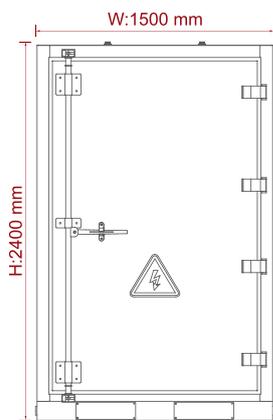
## Outdoor Energy Storage Battery Cabinet 215KWh/271KWh



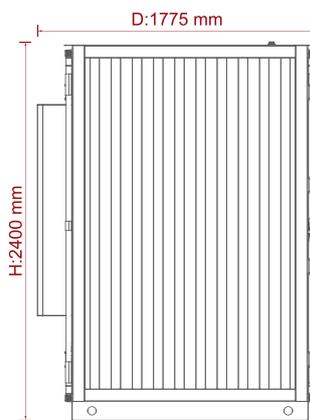
### • Features

- Multi-level BMS built-in.
- IP55 fire and explosion proof cabinet.
- Scalable in power and capacity.
- Easy for on site installation.
- Fire proof devices in each modular and in the cabinet.

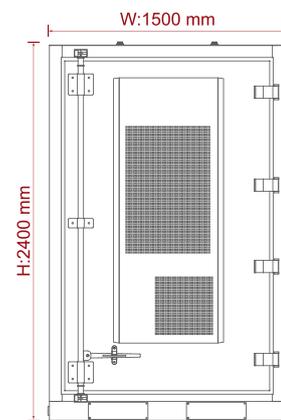
### • Product Dimensions



Front view



Side view



Back view


**• Technical Parameter**

<b>Energion 215KWh/271KWh</b>		
<b>Battery parameters</b>		
Cell	3.2V 280AH	3.2V 314AH
Battery type	LFP(LiFePO4)	
Battery module	51.2V 280AH	57.6V 314AH
Battery module Qty.	15	
Battery cluster	768V 280AH	864V 314AH
Battery cluster configuration	1P16S*15	1P18S*15
<b>Electrical parameters</b>		
Nominal energy	215Kwh	271Kwh
Nominal voltage	768Vdc	864Vdc
System voltage range	672-852VDC	756-958.5VDC
System charge/discharge rate	0.6P	0.5P
Depth of charge and discharge	100%~10%	
No. of cycles	8000cycles(70%SOH)	
Compensation methods	Dynamic real-time compensation	
Recommended AC side power	125KW	
<b>Protection</b>		
DC input/output	Disconnect switches+fuses	
Electrical isolation	Inter - module controlled protection breakout	
Fire protection systems	Two-stage aerosol fire module + Smoke sensors + Enclosure explosion - proof pressure relief device	
<b>System Parameters</b>		
Communication	RS485/CAN/LAN/4G	
Communication protocols	ModBusTCP/CAN	
Working temperature range	0~40°C charge/-20~50°C Discharge	
Relative humidity	0~95%(No condensing)	
Cooling	Dry Self-Cooling	
Noise	≤65db	
Highest altitude	4000m(>2000m derating)	
Degree of protection	IP55	
Dimension(W*D*H)	1500*1775*2400mm	
Weight	3.2T	3.3T
Installation method	Cabinet floor mounting	
Certification	CE-EMC(EN 61000-6-2/-4) ; CE-LVD(IEC 62477-1) ; IEC 62619 ; UN38.3	